

What is claimed is:

1. A spray nozzle, comprising:

a discharge surface;

5 an orifice disposed on the discharge surface;

an impingement surface oppositely facing the orifice, the impingement surface oriented at an impingement angle measured relative to a centerline of the orifice, the impingement angle being 90 degrees or less;

10 a deflection ridge, the deflection ridge bridging a gap between the impingement surface and the discharge surface, the deflection ridge defining a spray angle which limits the discharge of fluid; and

a fluid fitting in fluid connection with the orifice, the fluid fitting adapted to receive a pressurized fluid.

15 2. The spray nozzle of claim 1, wherein the impingement angle is generally 85 degrees.

20 3. The spray nozzle of claim 1, wherein the deflection ridge comprises a filleted corner.

4. The spray nozzle of claim 3, wherein the filleted corner smoothly joins with the impingement surface.

25 5. The spray nozzle of claim 1, wherein the deflection ridge comprises two filleted corners, the filleted corners intersecting at an angle defining the spray angle.

30 6. The spray nozzle of claim 5, wherein the two filleted corners smoothly join with the impingement surface.

7. The spray nozzle of claim 5, wherein the spray angle is about 100 degrees to about 160 degrees.

5 8. The spray nozzle of claim 1, wherein the deflection ridge comprises a filleted corner and a sharp corner, the filleted corner and the sharp corner intersecting at an angle defining the spray angle.

9. The spray nozzle of claim 8, wherein the spray angle is about 80 degrees to about 120 degrees.

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10. The spray nozzle of claim 8, wherein the filleted corner and the impingement surface join at a sharp ridge.

15 11. The spray nozzle of claim 8, wherein the filleted corner extends past the intersection of the filleted corner and the sharp corner and forms a spherical indentation therein.

20 12. The spray nozzle of claim 8, wherein the sharp corner further comprises a trailing edge curve, the trailing edge curve extending towards the filleted corner at a distal end of the sharp corner.

25 13. The spray nozzle of claim 8, wherein the sharp corner further comprises a leading edge curve, the leading edge curve extending away from the filleted corner at the intersection of the filleted corner and the sharp corner.

14. A spray nozzle system, comprising:
a body comprising a discharge surface, an orifice disposed on the
discharge surface, and a fluid fitting in fluid connection with the orifice, the fluid
fitting adapted to receive a pressurized fluid; and

5 a spray head removably mounted to the body, the spray head comprising:
an impingement surface, the impingement surface oppositely facing
the discharge surface, the impingement surface oriented at an impingement
angle measured relative to a centerline of the orifice, the impingement angle
being 90 degrees or less; and

10 a deflection ridge, the deflection ridge bridging a gap between the
impingement surface and the discharge surface, the deflection ridge defining a
spray angle which limits the discharge of fluid.

15 15. The system of claim 14, wherein the impingement angle is
generally 85 degrees.

16. The system of claim 14, wherein the deflection ridge comprises a
filleted corner.

20 17. The system of claim 16, wherein the filleted corner smoothly joins
with the impingement surface.

25 18. The system of claim 14, wherein the deflection ridge comprises two
filleted corners, the filleted corners intersecting at an angle defining the spray
angle.

19. The system of claim 18, the two filleted corners smoothly join with
the impingement surface.

20. The system of claim 18, wherein the spray angle is about 100 degrees to about 160 degrees.

5 21. The system of claim 14, wherein the deflection ridge comprises a filleted corner and a sharp corner, the filleted corner and the sharp corner intersecting at an angle defining the spray angle.

22. The system of claim 21, wherein the spray angle is about 80 degrees to about 120 degrees.

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23. The system of claim 21, wherein the filleted corner and the impingement surface join at a sharp ridge.

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24. The system of claim 21, wherein the filleted corner extends past the intersection of the filleted corner and the sharp corner and forms a spherical indentation therein.

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25. The system of claim 21, wherein the sharp corner further comprises a trailing edge curve, the trailing edge curve extending towards the filleted corner at a distal end of the sharp corner.

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26. The system of claim 21, wherein the sharp corner further comprises a leading edge curve, the leading edge curve extending away from the filleted corner at the intersection of the filleted corner and the sharp corner.

27. The system of claim 14, wherein the spray head is interchangeable on the body.

28. A method of dispersing fluid, comprising:

discharging a pressurized fluid from an orifice onto an impingement surface, the impingement surface oriented at a deflection angle measured relative to a centerline of the orifice, the angle being less than 90 degrees;

5 deflecting the fluid at the impingement surface to form an impingement flow; and

deflecting the impingement flow at a deflection ridge to restrict an exit plume to a limited circumferential angle.

10 29. The method of claim 28, wherein the deflection angle is generally 85 degrees.

15 30. The method of claim 28, wherein restricting the exit plume to a limited circumferential angle further comprises deflecting the impingement flow using a filleted corner.

20 31. The method of claim 28, wherein limiting the exit plume to a limited circumferential angle further comprises deflecting the impingement flow using two filleted corners, the filleted corners intersecting at an angle defining the spray angle.

32. The method of claim 31, wherein the spray angle is about 100 degrees to about 160 degrees.

25 33. The method of claim 28, wherein limiting the exit plume to a limited circumferential angle further comprises deflecting the impingement flow using a filleted corner and a sharp corner, the filleted corner and the sharp corner intersecting at an angle defining a spray angle.

34. The method of claim 33, wherein the spray angle is about 80 degrees to about 120 degrees.

35. The method of claim 28, wherein the fluid is pressurized in a range
5 from about 25 psi to about 35 psi.

36. A spray nozzle, comprising:

a body, comprising:

a substantially planar discharge surface;

10 a fluid fitting on an end of the body away from the discharge surface; and

an orifice disposed on the discharge surface and in fluid connection with the fluid fitting; and

a spray head removably attached to the body, comprising:

15 a substantially planar sealing surface interfaceable with the discharge surface of the body, the sealing surface having a generally triangular shape with a triangular base and a rounded triangular tip opposite the triangular base;

20 a planar impingement surface indented in the sealing surface, the impingement surface oppositely facing the orifice when the spray head is attached to the body, the impingement surface oriented at an impingement angle measured relative to a centerline of the orifice, the impingement angle being 90 degrees or less; and

25 a deflection ridge at the intersection of the impingement surface and the sealing surface, the deflection ridge being at least in part adjacent to the triangular base of the sealing surface.

37. The spray nozzle of claim 36, wherein the impingement angle is generally 85 degrees.

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38. The spray nozzle of claim 36, wherein the deflection ridge comprises a fillet smoothly joined with the impingement surface.

5 39. The spray nozzle of claim 36, wherein the deflection ridge comprises two filleted corners smoothly joined with the impingement surface, the filleted corners intersecting at an angle defining the spray angle.

40. The spray nozzle of claim 39, wherein the spray angle is about 100 degrees to about 160 degrees.

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41. The spray nozzle of claim 36, wherein the deflection ridge comprises a filleted corner and a sharp corner, the filleted corner and the sharp corner intersecting at an angle defining the spray angle.

15 42. The spray nozzle of claim 41, wherein the spray angle is about 80 degrees to about 120 degrees.

43. The spray nozzle of claim 41, wherein the filleted corner and the impingement surface interface at a sharp ridge.

20 44. The spray nozzle of claim 41, wherein the filleted corner extends past the intersection of the filleted corner and the sharp corner and forms a spherical indentation therein.

25 45. The spray nozzle of claim 41, wherein the sharp corner further comprises a trailing edge curve, the trailing edge curve extending towards the filleted corner at a distal end of the sharp corner.

46. The system of claim 21, wherein the sharp corner further comprises a leading edge curve, the leading edge curve extending away from the filleted corner at the intersection of the filleted corner and the sharp corner.